

## BIOLOGICAL NOTES ON ARADIDAE.

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The three species of this family found at Onteora, in the Catskills, alt. 2,400 feet, were *Aneurus inconstans* Say, *Aradus robustus* Uhler, and *A. quadrilineatus* Say.

As to *Aneurus inconstans*, data on occurrence have relatively little significance. I have found this species—adults, nymphs and ova—in winter under suitable bark. On August 16, 1932, *A. inconstans* was found under bark of a small beech log lying in a shady spot by a roadside. The 20 adults secured were found under rather close-lying loose bark, *not* damp—in fact, it felt dry to the hand. On July 1, 1933, I got a few more under bark of another fallen log. They were found under somewhat dry bark on the smaller branches, where it was cracked and loose. On September 3rd, under loose bark, three adults and one half-grown nymph of the species were noted. On July 5, 1934, under bark—and fairly tight bark, too—of a short end of a maple log lying on the ground among bushes, a number of adults were found together with several groups of eggs. They were along the loose edges of the bark where it was separated from the trunk, but dry; none was found where it was damp. The eggs were attached to the surface of the wood and *not* on the underside of the bark, as is the case with *Neuroctenus*.

The two species of *Aradus* gave more interesting results. *Aradus quadrilineatus* appears to be an inveterate Rambler. It was found abroad singly, apparently at rest from flight, on a number of occasions. On July 22, 1933, at 6:30 p. m., one was found perched on one of the flags of the walk; on the 28th, another was found on one of the stone steps. On July 15, 1934, one was picked up on the high house porch. This habit had been noted before on a warm April day in New England, when *A. quadrilineatus* was seen perched on bean-poles in a pile, in the sunlight, ready for flight; and frequently since. On August 16, 1932, on the outside of the beech log where *Aneurus* was found and at the same time (about 10 a. m.) near a crack in the bark were one large and one small nymph, which reached the adult on August 24, a week later; the larger was *quadrilineatus* and the smaller *A. robustus*. On July 11, 1933, from the damper parts of a fallen log noted nymphs of *A. quadrilineatus*, from the last to the third instar. The following year, on July 4, I saw two *quadrilineatus* nymphs on a log near a road, one about 2nd and the other 4th(?) instar, both walking

about. They did not come from the damp parts under the bark, but apparently from the dryer, whence I disturbed them. Again on July 9 I noted the same 5th instar nymph. It was sitting on the bare upper side of the log, where the bark had been peeled off, in the full sunshine. It appeared to be asleep—at least, it was in the resting position and entirely motionless—antennae stretched straight forward held close together and apparently resting on the surface; the body likewise lying right on it. I watched for two or three minutes and it did not move in that time, not even the usual vibration of the antennae, which among the aradids appears to indicate attention or alarm. Again on July 14, I saw the same two nymphs on the bare part of the log, in resting position. During the greater part of the day they are concealed under the dry part of the bark. A little later, the larger nymph had concealed itself entirely; and the smaller had taken shelter under the loose edge of the bark. On the end of the log, on the bare wood, was another smaller nymph, possibly 2nd instar; this was paper-thin, while the older nymph was quite thick through the body—obviously about to molt. Cigarette smoke was blown on the smaller nymph, which began to walk about apparently aimlessly. On July 15, at 1:30 p. m., the three nymphs were found after some search and put in a glass jar together with same pieces of bark for their shelter. These nymphs appear not to be negatively heliotropic. They were put in the full daylight from a window while in resting position and it did not disturb them in the least. When touched, they feigned death, keeping the legs close to the body, antennae closely held together and pointed forward and absolutely motionless. While in captivity they were very inactive—at least, they got progressively thinner until they died some time in late August without any of them transforming to the adult.

*Aradus robustus* was first found under loose bark of a beech log, a nest of nymphs on July 25, 1932. Two of these same nymphs were noted on the outside of the log, in the sun, on August 4. On August 16 I once more noted two nymphs on the outside of a beech log near a crack in the bark, the larger of which was the *quadrilineatus* before mentioned; and the smaller, which came to the adult some time between the 24th and 28th turned out to be *robustus*. On July 3, 1933, one adult *A. robustus* was taken; another was found on July 19, in company with four nymphs from the 2nd to the 5th instars. These were kept alive, but did not survive in captivity. The last *robustus* to be taken was recorded on July 27, 1934, from under the bark of a hemlock log lying along the road over the dam at the lake.